

Attorney Docket No. VELOP0115US

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of

Applicant: Tonkovich et al.  
Serial No.: 10/777,033  
Filed: February 11, 2004  
For: PROCESS FOR CONDUCTING AN EQUILIBRIUM LIMITED CHEMICAL REACTION USING MICROCHANNEL TECHNOLOGY  
Art Unit: Not yet known  
Examiner: Not yet known

### INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1345

Sir:

1. Pursuant to 37 C.F.R. 1.97 and 1.98, and in compliance with 37 C.F.R. 1.56, the Office's attention is directed to the patents, pending applications, publications and other information listed on the attached PTO-1449. A copy of each listed document is enclosed except for: (a) pending applications or (b) those previously cited or submitted to the Office in the following application(s) upon which this application relies for an earlier filing date under 35 U.S.C. 120:

Serial No.: \_\_\_\_\_  
Filing Date: \_\_\_\_\_

Regarding any document, publication or other information for which a date is not given on the attached PTO-1449, Applicant(s) believe(s) the same may qualify as "prior" art to this application and should be treated accordingly, although Applicant(s) reserve(s) the right to contest the prior art status of any document, publication or information, should issue arise.

2. Regarding each listed document that is not in the English language, an English-language translation accompanies this Statement as indicated on the attached PTO-1449 or a concise explanation of the relevance of the document is set forth in the following document(s):

- (a) ☐ Copy of each English language version of a search report indicating the degree of relevance found by the foreign office of each document being submitted from the search report.
- (b) ☐ Attachment entitled "Concise Explanation of Relevance of Non-English Language Documents".

3. Pursuant to 37 C.F.R. 1.97(b) this Statement is being filed (one must be checked):

- (a) ☒ Within 3 months of the filing date, date of entry into the National Stage, or filing date of CPA.
- (b) ☐ Before the mailing date of a first Office Action on the merits. If this Statement is not filed before the mailing date of a first Office Action on the merits, the required certification is given below or, in the absence thereof, the Office is authorized to charge the required fee set forth in 37 C.F.R. 1.17(p) to Deposit Account No. 18-0988 for consideration of this Statement.
- (c) ☐ Before the mailing date of a first Office Action on the merits after a first or second submission after final rejection under 37 C.F.R. 1.129(a).

(d) \_\_\_ After the period set forth in 37 C.F.R. 1.97(b) but before the mailing date of either a final action or a notice of allowance.

(1) \_\_\_ The required certification is given below, or

(2) \_\_\_ Enclosed is a check covering the fee set forth in 37 C.F.R. 1.17(p) for consideration of this Statement, or

(3) \_\_\_ Charge the fee set forth in 37 C.F.R. 1.17(p) to Deposit Account No. 18-0988

(e) \_\_\_ After the mailing date of either a final action or a notice of allowance, but before payment of the issue fee. Petition hereby is made for consideration of this Statement and the required certification is indicated below.

(1) \_\_\_ Enclosed is a check covering the fee set forth in 37 C.F.R. 1.17(p), or

(2) \_\_\_ Charge the fee set forth in 37 C.F.R. 1.17(p) to Deposit Account No. 18-0988.

4. Certification (if applicable)

(a) \_\_\_ The undersigned hereby certifies that each item of information contained in this Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than 3 months prior to the filing of this Statement.

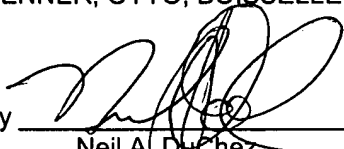
(b) \_\_\_ The undersigned hereby certifies that no item of information contained in this Statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the undersigned's knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. 1.56(c) more than 3 months prior to the filing of this Statement.

5. The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to Deposit Account No. 18-0988.

Respectfully Submitted,

RENNER, OTTO, BOISSELLE & SKLAR, LLP

By

  
Neil A. DuChesne  
Reg. No. 26,725

1621 Euclid Avenue, 19th Floor  
Cleveland, Ohio 44115  
(216) 621-1113

**CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8**

I hereby certify that this correspondence (along with any paper referenced as being attached or enclosed) is being deposited on the below date with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: 04/08/04

  
Janet Farr

Form PTO-1449 (Modified)

Atty Docket No.

Serial No.

LIST OF PATENTS AND PUBLICATIONS  
FOR APPLICANT'S  
INFORMATION DISCLOSURE STATEMENT

VELOP0115US

10/777,033

Applicant: Tonkovich et al.

Filing Date

Group

02/11/04

(Use several sheets if necessary)

## U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
	4,298,354	11/03/81	Hardman et al.	44	56	
	4,392,362	07/12/83	Little	62	514	
	4,516,632	05/14/85	Swift et al.	165	167	
	4,596,782	06/24/86	Courty et al.	502	302	
	5,238,895	08/24/93	Marchionna et al.	502	169	
	5,254,520	10/19/93	Sofianos	502	307	
	5,309,637	05/10/94	Moriarty	29	890.054	
	5,317,805	07/07/94	Hoopman et al.	29	890.03	
	5,384,335	01/24/95	Tierney et al.	518	700	
	5,472,986	12/05/95	Van Dijk	518	705	
	5,610,202	03/11/97	Marchionna et al.	518	700	
	5,611,214	03/18/97	Wegeng et al.	62	498	
	5,727,618	03/17/98	Mundinger et al.	165	80.4	
	5,767,039	06/16/98	Yamagishi et al.	502	342	
	5,811,062	09/22/98	Wegeng et al.	422	129	
	5,858,314	01/12/99	Hsu et al.	422	211	
	6,114,279	09/05/00	Fukui et al.	502	342	
	6,126,723	10/03/00	Drost et al.	96	4	
	6,216,343 B1	04/17/01	Leland et al.	29	890.032	
	6,129,973	10/10/00	Martin et al.	428	166	
	6,192,596 B1	02/27/01	Bennett et al.	34	76	
	6,200,536 B1	03/13/01	Tonkovich et al.	422	177	
	6,220,497 B1	04/24/01	Benz et al.	228	118	
	6,230,408 B1	05/15/01	Ehrfeld et al.	29	890.039	
	6,313,393 B1	11/06/01	Drost	136	201	



Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
	6,342,538 B1	01/29/02	Matsumura et al.	518	715	
	6,352,577 B1	03/05/02	Martin et al.	96	4	
	6,381,846 B2	05/07/02	Insley et al.	29	890.039	
	6,415,860 B1	07/09/02	Kelly et al.	165	748	
	6,433,029	08/13/02	Fitzpatrick	518	706	
	6,486,219 B1	11/26/02	Janda et al.	518	706	
	6,488,838 B1	12/03/02	Tonkovich et al.	208	108	
	6,497,856 B1	12/24/02	Lomax, Jr. et al.	423	651	
	6,540,975 B2	04/01/03	Tonkovich et al.	423	659	
	5,611,214	03/18/97	Wegeng et al.	62	498	
	5,811,062	09/22/98	Wegeng et al.	422	129	
	6,129,973	10/10/00	Martin et al.	428	166	
	6,192,596 B1	02/27/01	Bennett et al.	34	76	
	6,200,536	03/13/01	Tonkovich et al.	422	177	
	6,488,838 B1	12/03/02	Tonkovich et al.	208	108	
	6,540,975 B2	04/01/03	Tonkovich et al.	423	659	
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	6,546,998 B2	04/15/03	Oh et al.	165	110	
	2002/0177741A1	11/28/02	Allison et al.	568	840	
	H1311	05/03/94	Nakamura et al.	518	713	
	3,176,763	04/06/65	Frohlich			
	4,128,409	12/05/78	Bennett	62	26	
	4,183,403	01/15/80	Nicholson	165	166	
	4,386,505	06/07/83	Little	62	514 R	
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	4,434,845	03/06/84	Steeb			
	4,516,632	05/14/85	Swift et al.	165	167	
	5,058,665	10/22/91	Harada	165	164	
	5,271,459	12/21/93	Daschmann	165	166	
	5,309,637	05/10/94	Moriarty	29	890.054	
	5,317,805	06/07/94	Hoopman et al.	29	890.03	
	5,324,452	06/28/94	Allam et al.	252	373	

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
	5,518,697	05/21/96	Dalla Betta et al.	422	173	
	5,727,618	03/17/98	Mundinger et al.	165	80.4	
	5,858,314	01/12/99	Hsu et al.	422	211	
	5,911,273	06/15/99	Brenner et al.	165	167	
	5,927,396	07/27/99	Damsohn et al.	165	167	
	6,056,932	05/02/00	von Hippel et al.	423	376	
	6,159,358	12/12/00	Mulvaney, III et al.	208	46	
	6,167,952	01/02/01	Downing	165	167	
	6,193,501 B1	02/27/01	Masel et al.	431	170	
	6,203,587 B1	03/20/01	Lesieur et al.	48	61	
	6,216,343 B1	04/17/01	Leland et al.	29	890.032	
	6,220,497 B1	04/24/01	Benz et al.	228	118	
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	6,230,408 B1	05/15/01	Ehrfeld et al.	29	890.039	
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	6,274,101 B1	08/14/01	Sechrist	422	198	
	6,294,138 B1	09/25/01	von Hippel et al.	422	200	
	6,318,913 B2	11/20/01	Wakamiya et al.	396	576	
	6,364,007 B1	04/02/02	Fischer	165	166	
	6,381,846 B2	05/07/02	Insley et al.	29	890.039	
	6,389,696 B1	05/21/02	Heil et al.	29	890.039	
	6,497,856 B1	12/24/02	Lomax, Jr. et al.	423	651	
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	2001/0025705 A1	10/04/01	Nash et al.	165	167	
	2001/0030041A1	10/18/01	Boneberg et al.	165	166	
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	2002/0029871A1	03/14/02	Kern	165	151	
	2002/0031455 A1	03/14/02	Hippel et al.	422	173	
	2002/0051741 A1	05/02/02	ABE et al.	422	199	
	2002/0071797 A1	06/13/02	Loffler et al.	422	190	
	2002/0081473 A1	06/27/02	Hanai et al.	429	26	
	2002/0106539 A1	08/08/02	Chung et al.	429	19	

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
	2002/0131907 A1	09/19/02	Iwasaki	422	110	

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Examiner Initial	Document Number	Date	Country	Class	Sub-class	Translation	
						Yes	No
	97/32687	12/09/97	WO			Abstract	
	98/55812	10/12/98	WO				
	00/06295	10/02/00	WO				
	01/12312 A2	22/02/01	WO				
	01/54807 A1	02/08/01	WO				
	01/95237 A2	13/12/01	WO				
	0 903 174 A1 ✓	24/03/99	EP				
	1 018 485 A1 ✓	12/07/00	EP				
	03/106386 A2	24/12/03	WO				
	2,247,662 ✓	22/03/99	CA				
	39 26 466 A1 ✓	14/02/91	DE			x	
	1 362 634 A1	19/11/03	EP				
	03/078052 A1	25/09/03	WO				
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	02/02220 A1 ✓	10/01/02	WO				
	0 904 608 B1	19/12/01	EP				

## OTHER ART

Examiner Initial	Author, Title, Date, Pertinent Pages, etc.
	Matlosz et al.; "Microreactors as Tools in Chemical Research"; Microreaction Technology; IMRET 5: Proceedings of the Fifth International Conference on Microreaction Technology.
	Srinivasn et al.; "Micromachined Reactors for Catalytic Partial Oxidation Reactions"; AIChE Journal; November 1997; Vol. 43, No. 11; pp. 3059-3069.

Examiner Initial	Author, Title, Date, Pertinent Pages, etc.
	TeGrotenhuis et al.; "Optimizing Microchannel Reactors by Trading-Off Equilibrium and Reaction Kinetics through Temperature Management; Prepared for presentation at IMRET 6 - 6 <sup>th</sup> International Conference on Microreaction Technology; March 2002.
	Wegeng et al.; "Compact Fuel Processors for Fuel Cell Powered Automobiles Based on Microchannel Technology"; Fuel Cells Bulletin No. 28; pp. 8-13.
	Rostami et al.; "Flow and Heat Transfer for Gas Flowing in Microchannels: a Review"; Heat and Mass Transfer 38 (2002) 359-367.
	Smith, Eric M.; Thermal Design of Heat Exchangers. A Numerical Approach; 1997; Wiley; New York, pages 279-288.
	Waku et al.; "Effects of O <sub>2</sub> Concentration on the Rate and Selectivity in Oxidative Dehydrogenation of Ethane Catalyzed by Vanadium Oxide: Implications for O <sub>2</sub> Staging and Membrane Reactors"; Ind. Eng. Chem. Res. 2003, 41, 5462-5466.
	International Search Report, Application No. PCT/US03/23890, dated 10 December 2003.
	M. Matlosz et al.; Microreaction Technology; Proceedings of the Fifth International Conference on Microreaction Technology; October 2001; Springer-Verlag.
	Smith, Eric M.; Thermal Design of Heat Exchangers; A Numerical Approach; 1997; Wiley, New York.
	Pettersen et al.; Development of Compact Heat Exchangers for CO <sub>2</sub> Air-Conditioning Systems; Volume 21, No. 3; pages 180-193; 1998; Great Britain.
	Wadekar, V. V.; Compact Heat Exchangers; A Che's Guide to Ches; American Institute of Chemical Engineers; December 2000; pages 39-40; United States.
	Kays, W. M.; Compact Heat Exchangers, Third Edition; 1984; Reprint Edition 1998 With Corrections; Kreiger Publishing Co.; Malabar, Florida.
EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

### Information Disclosure Statement PTO-1449 (Modified)

The identification of any reference is not intended to be, and should not be understood as being, an admission that such publication, in fact, constitutes "prior art" within the meaning of applicable law since, for example, a given reference may have a later effective date than first seems apparent or the reference may have an effective date which can be antedated. The "prior art" status of any reference is a matter to be resolved during prosecution.

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